ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE - 2009

DATABASE MANAGEMENT SYSTEM-I

SEMESTER - 2

Time : 3 Hours] [Full Marks : 70

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

i) What is a field of data that can be used to locate a related field of record ?

a) Data type b) Pointer

c) Chain d) None of these.

ii) Which one of the following is the example of Dynamic Hashing ?

a) Open Address Hashing b) Chain Hashing

c) Linear Hashing d) All of these.

iii) Which of the following is an attribute that holds multiple values for a single entity ?

a) Simple b) Composite

c) Derived d) Multi-valued.

iv) Which of the following clauses can be present in an updatable view ?

a) Group By b) Order By

c) Distinct d) None of these.

v) What was the main drawback of the hierarchical model ?

a) Lack of standardization b) Poor performance

c) High cost d) None of these.

vi) Which is another name for weak entity ?

a) Child b) Owner

c) Dominant d) All of these.

vii) Which of the following is the type of metadata ?

a) Operational b) EDW

c) Data mart d) All of these.

viii) A table can have only one

a) Primary key b) Alternate key

c) Candidate key d) none of these.

ix) What is a set of possible data values called ?

a) Degree b) Attribute

c) Domain d) Cardinality.

x) Relations produced from an *E-R* model will always be in

a) 1NF b) 2NF

c) 3NF d) 4NF.

8. Define ER model. What is an entity ? What do you mean by multi-valued attribute ? From the following information identify the entities, relationships and draw the ER diagram :

A store has different counters managed by different employees. A counter has item but no two counters have common items. Customers buy from different counters but bills are prepared at the bill counter only. Once in a month the performance of the persons managing different counters are evaluated in terms of sale. Items are also reviewed and slow moving items are identified. 2 + 2 + 2 + 9

9. Answer as directed for the following :

Hotel (Hno,Name,Address) Room (Rno,Rtype,Hno,Price)

Booking (Hno.Gno,Rno,Dt_from,Dt_to)

Guest (Gno,GName,GAddress)

a) Find the names of all guests who are staying in hotels either in Kolkata or Chennai. [Relational Calculus]

b) Find the total number of guests in Hotel Taj. [Tuple Relational Calculus]

c) List the number of rooms in each hotel. [Domain Relational Calculus]

d) Find the room with the maximum price. [SQL]

e) Find the hotel with 2nd maximum no. of rooms. (SQL) 3 + 3 + 3 + 2 + 4

10 Write short note on any *three* of the following : 3 × 5

a) Multi-level index

b) Aggregation in ER model

c) Three level data abstraction

d) DBMS architecture

e) Atomicity problem.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Explain the three schema architecture.

3. Explain generalization, specialization and aggregation in Entity Relation Diagram.

4. Consider the following table with their functional dependencies :

Employee (Emp_Id, Emp_Name, Address, Design, Dept_Id, Dept_Name, Course, Duration)

Emp_Id → Emp_Name, Address, Design, Dept_Id, Course

Dept_Id → Dept_Name

Course → Duration

Normalize the table upto BCNF.

5. Explain the Query optimization technique with relevant examples.

6. Write down the functions of a DBA.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. What is Normalization ? What is its use ? Compare between BCNF and 3rd Normal form.

$R = (A, B, C, D, E)$ $F = \{A \rightarrow BC, CD \rightarrow E, B \rightarrow D, E \rightarrow A\}$

Show that it is lossless decomposition. 2 + 3 + 4 + 6

11. Establish the statement, "*SQL* is a relationally complete language". Consider the following schema of a relational database :

Sailors (sid, sname, rating, age)

Reserves (sid, bid, day)

Boats (bid, bname, colour)

For each of the following queries write an expression for Relational Algebra OR Relational Calculus. (any *six*)

a) Find the names of sailors who have reserved boat 103.

b) Find the names of sailors who have reserved a red boat.

c) Find the colour of boats reserved by Biswarup.

d) Find the names of sailors who have reserved at least one boat.

e) Find the names of sailors who have reserved a red boat or a green boat.

f) Find the names of sailors who have reserved a red boat and a green boat.

g) Find the names of sailors with age over 20 who have not reserved a red boat.

h) Find the names of sailors who have reserved all boats. 3 + (2 × 6)

END